
Calculate expected pulse loss

Use **Procedure 6** to calculate expected pulse loss.

Procedure 6

- 1 Collect loop makeup data between the line card and the terminal. For each cable section, the data required is:
 - cable type (PIC or pulp)
 - gauge
 - length
 - type of plant construction (underground, aerial, or in-building)
- 2 Calculate individual cable section losses by using the figures in **Tables 2** through **4**, and the following equation:
$$CSLi = SLi \times Li$$
 - CSLi = cable section loss for section *i*
 - SLi = section length of section *i*
 - Li = loss per unit length for section *i*

- 3 Correct individual cable section losses for maximum cable temperature by using the following equation:

$$TCLi = CSLi \times TCFi$$

- $TCLi$ = temperature corrected loss for section i
- $TCFi$ = temperature correction factor for section i

Correction factors:

- aerial cable TCF = 1.1
- underground cable TCF = 1.04
- in-building cable TCF = 1

- 4 Determine junction loss (see **Figure 3**).

Note: Junction loss due to gauge discontinuity of outside plant cables and D inside wire varies between 0.03 dB and 0.07 dB and can be ignored. However, AMP 25-pair under-carpet wiring has a characteristic impedance of 40 ohm at 256 kHz, and its junction loss is approximately 2 dB. This must be included in the calculation.

- 5 Calculate the expected pulse loss (EPL) by finding the sum of the items.
- 6 Reject loops whose expected pulse loss is greater than 12 dB.

Example of applying **Procedure 6**

Section 1:

Mainframe bulkhead to DF1 - 500m, 26 AWG PIC, underground

Section 2:

DF1 to DF2 - 200m, 26 AWG PIC, inside

Section 3:

DF2 to terminal - 24 AWG NT D-inside

Therefore:

$SL1 = 1.5$ km, $SL2 = 0.2$ km, $SL3 = 0.1$ km

From **Tables 2** and **3**:

$L1 = 13.7$ dB/km, $L2 = 13.7$ dB/km, $L3 = 13.3$ dB/km.

Using the equation in Step 2, we arrive at the following:

$CSL1 = 6.85$ dB, $CSL2 = 2.74$ dB, and $CSL3 = 1.33$ dB

Temperature corrections:

Using correction factors of $TCF1 = 1.04$, and $TCF2$ and $TCF3 = 1$, and using the equation in Step 3 results in $TCL1 = 7.12$ dB, $TCL2 = 2.74$ dB, and $TCL3 = 1.33$ dB.

Expected pulse loss (EPL) value:

Neglecting any junction loss (see the note in Step 4), Step 5 results in an EPL value of $TSL1 + TSL2 + TSL3 + 0 = 11.19$ dB.

This is under the 12 dB limit and meets the criteria.

Table 2
Cable attenuation at 256 kHz and 21.1 degrees C (70 degrees F)

Cable type	26 AWG		24 AWG		22 AWG		19 AWG	
	dB/kft	dB/km	dB/kft	dB/km	dB/kft	dB/km	dB/kft	dB/km
PIC	4.2	13.7	3.1	10.2	2.5	8.1	1.7	5.6
Pulp	4.3	14.3	3.5	11.4	2.7	9.0	2.0	6.6

Table 3
Attenuation at 256 kHz for U/C cable

WE 4-pair		AMP 25-pair	
dB/kft	dB/km	dB/kft	dB/km
4.6	15.3	19.0	63.3

Table 4
Attenuation at 256 kHz for D inside wiring cable

NT		WE		Superior		General	
dB/kft	dB/km	dB/kft	dB/km	dB/kft	dB/km	dB/kft	dB/km
4.0	13.3	3.2	10.7	3.7	13.3	4.6	15.3

Figure 3
Junction loss versus cable characteristic impedance

